



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

## REGION III

841 Chestnut Building  
Philadelphia, Pennsylvania 19107

FACT SHEETCOPPERWhat is Copper?

Copper is a naturally occurring metallic element. In small amounts, it is essential and beneficial to human metabolism.

Sources of Copper

Copper may occur naturally in water supply systems or as the result of chemical reactions between the water and copper distribution pipes. If water is aggressive, or somewhat acidic, copper may leach out of copper-based piping materials and brass fixtures.

Health Effects of Copper

Physiologically, copper is important to human metabolism. Small amounts are generally regarded as non-toxic. A deficiency in copper can result in nutritional anemia in infants.

Ingested copper gradually accumulates in the liver. Symptoms of chronic copper exposure include lack of coordination, seizures, behavioral abnormalities, anemia, and jaundice. Acute exposure to high levels of copper may cause fatigue, abdominal cramps, headaches, nausea, dizziness, and vomiting. High concentrations may eventually kill liver cells, resulting in the release of copper into the bloodstream. The released copper may damage red blood cells, kidneys, corneas, and the central nervous system.

Relatively high concentrations of copper (generally greater than 2000 parts per billion- see below) can result in staining of porcelain fixtures and a noticeable taste in drinking water. Therefore, for aesthetic and physiological reasons, it is desirable to limit the concentration of copper in drinking water.

AR500838

EPA Standard

Copper occurs in drinking water primarily as the by-product of corrosion (especially if the water is considered soft or acidic). EPA has established an aesthetically based water quality standard for copper at 1000 parts per billion (ppb). As a result of the recent information made available on the human health effects of copper, EPA has proposed a Maximum Contaminant Level (MCL) of 1300 ppb. An MCL indicates the maximum concentration allowable in drinking water to minimize our exposure to potentially dangerous levels of a particular contaminant. One ppb represents one part of the compound (by weight) for every billion parts of water. The following analogies are offered to help illustrate the units of concentration.

1 ppb = 1 penny in \$10 million  
or  
1 ppb = 1 second in 32 years

Unfortunately, at these levels, copper is not readily detected via taste or smell; therefore, detection is limited to sensitive analytical instruments.

What Actions Should You Take?

If you are concerned about copper in your drinking water, the first action you should take is to seek the assistance of your State or County Health Officials. The health officials may advise you to have the water in your well retested. Resampling the well may change the evaluation of the quality of your water.

You may also consider treating your water to remove copper. Since copper in drinking water is usually the result of aggressive water acting on plumbing materials containing copper, concentrations can usually be reduced by controlling the acidity of the water. Various treatment processes are commercially available that can be installed at the point where water enters your home or at the faucet. For more information on home treatment devices, write for Region III's drinking water information guide (free) titled "Home Water Treatment Units" at:

Environmental Protection Agency  
Region III  
Drinking Water Section (3WM41)  
841 Chestnut Street  
Philadelphia, Pa 19107.

Revised 3/1/89

AR500839